

Find each integral

$$\textcircled{1} \int \underline{x^2} \sqrt{\underline{5+2x^3}} \underline{dx}$$

$$u = 5 + 2x^3$$

$$\frac{du}{6} = \frac{6x^2 dx}{6}$$

$$\frac{1}{6} du = x^2 dx$$

$$\frac{1}{6} \int \sqrt{u} du$$

$$\frac{1}{6} \int u^{\frac{1}{2}} du$$

$$\frac{1}{6} \frac{u^{\frac{3}{2}}}{\frac{3}{2}} = \frac{1}{6} \cdot \frac{2}{3} = \frac{2}{18}$$

$$\frac{1}{9} u^{\frac{3}{2}}$$

$$\boxed{\frac{1}{9} (5+2x^3)^{\frac{3}{2}} + C}$$

$$\textcircled{2} \int \cot 7x dx \quad (\text{Hint: rewrite in terms of sin + cos})$$

$$\int \frac{\cos 7x}{\sin 7x} dx$$

$$u = \sin 7x$$

$$\frac{du}{7} = \frac{7 \cos 7x dx}{7}$$

$$\frac{1}{7} du = \cos 7x dx$$

$$\frac{1}{7} \int \frac{1}{u} du$$

$$\frac{1}{7} \ln u + C$$

$$\frac{1}{7} \ln |\sin 7x| + C$$

(24)

$$\int 8(\underline{y^4 + 4y^2 + 1})^2 (y^3 + 2y) dy$$

$$u = y^4 + 4y^2 + 1$$

$$du = (4y^3 + 8y) dy$$

$$du = 4(y^3 + 2y) dy$$

$$\frac{1}{4} du = (y^3 + 2y) dy$$

$$\frac{8}{4} \int u^2 du$$

$$\frac{8}{4} \cdot \frac{u^3}{3} + C$$

$$\frac{2}{3} u^3 + C$$

$$\boxed{\frac{2}{3} (y^4 + 4y^2 + 1)^3 + C}$$

Sect. 6.2

#25-46 ( $\frac{1}{2}$ )